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FROM USMISSION UNESCO PARIS

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SUBJECT: UNESCO/INTERNATIONAL OCEANOGRAPHIC COMMISSION MEETING COORDINATES INDIAN OCEAN TSUNAMI WARNING SYSTEM

Ref: STATE 33352

¶1. Summary and Introduction:
The Intergovernmental Oceanographic Commission (IOC)convened The International Coordination Meeting for the development of a Tsunami Warning and Mitigation System for the Indian Ocean within a Global Framework, at UNESCO Headquarters in Paris, 3-8 March 2005. The meeting reinforced the IOC's lead role in coordinating global and regional tsunami warning systems, a primary USG goal. (The USG supports expanding the Pacific Tsunami Warning network -- which exists under the auspices of the IOC -- to the Indian Ocean and other at risk areas, within the framework of the Global Earth Observation System of Systems (GEOSS). The meeting also resulted in the establishment of an International Coordination Group for the Tsunami Warning and Mitigation System for the Indian Ocean, whose terms of reference will be approved at the IOC's General Assembly in June, as well as in the setting up of a process and timeline to design a basin-wide Indian Ocean Tsunami Warning System (IOTWS).

¶2. The meeting concluded with a communique that underscored national responsibility for establishing and managing national warning systems, emphasized the critical role of education for community preparedness, and urged all countries to engage in capacity building and technology transfer in the Indean Ocean region. It was decided that the IOTWS would consist of a coordinated network of national systems; though several countries vied for serving as the regional coordinator, there was no consensus on the matter. The communique also recommended that all Member States "make every endeavor" to share seismic, sea-level and other data relevant to tsunamigenic events at or near real-time. Within the IOC, the US has consistently supported open and free exchange of data, including in the context of tsunami warning systems; this is likely to remain a contentious issue as the IOTWS moves forward. The communique and all presentations are available at http://ioc.unesco.org/indotsunami.

¶3. IOC will sponsor a follow-up meeting in Mauritius, 14-16 April, with the aim to develop the draft design and work plan for presentation to the June IOC General Assembly. For additional information, contact Liz Tirpak (DOS/OES, tirpakej@state.gov, 202-647-0238) End Summary and Introduction.

MEETING OVERVIEW
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¶4. The IOC hosted the International Coordination Meeting for the Development of a Tsunami Warning and Mitigation System for the Indian Ocean within a Global Framework, in light of the tragic loss of life and massive destruction caused by the Indian Ocean tsunami of 26 December 2004.

¶5. The U.S. policy statement, made by Head of Delegation and U.S. Representative to the IOC Executive Council, NOAA Assistant Administrator Dr. Richard Spinrad, was well received (full text at end of cable). U.S. technical agency experts (USGS, USAID, NOAA) made formal presentations, intervened on key points and participated actively in all working groups. The experience of the U.S.-hosted Pacific Tsunami Warning Center was acknowledged by several speakers.

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¶6. Many U.S. delegation goals were reinforced in the opening statement by UNESCO Director-General Koichiro Matsuura, who emphasized IOC's role in linking internationally- run detection/alert systems with nationally-run warning systems. He underscored that a tsunami warning system should be fully embedded in the global ocean observing system (GOOS) that is regularly used for other hazards, such as storm surges and tropical cyclones. Following the February Global Earth Observation System of Systems (GEOSS) meeting and third Earth Observation Summit in Brussels, Matsuura noted that "synergies between existing and new systems will make possible a multi-hazard approach that should improve the cost-effectiveness and long-term sustainability of the overall system." Lastly, he drew substantially on the experience of the Pacific Tsunami Warning Center in designing and operating a warning system

TWS, providing for open, free and unrestricted exchange of data and information, and promoting the three components of a TWS: tsunami hazard assessment; detection/warning system; and adoption of preparedness measures.

¶7. Twenty IOC member states offered various levels of support for the creation of an Indian Ocean tsunami warning system. No nation rejected the idea, but no nation pledged support without conditions. (Note: Australia, India, Indonesia, and Thailand appear to have the most advanced planning with funding to back their plans. All three plans are based on the Pacific Ocean Tsunami Warning System (PTWS) of an integrated approach of hazard assessment, warning guidance, and preparedness, with India's plan being the most comprehensive. End Note.)

¶8. Data Exchange Issue - Several participants acknowledged that "immediate, free and open distribution of raw data from observing systems in real time" should serve as the founding principle for all regional and global tsunami warning systems, while India could offer only "international product sharing." Other participants suggested that the IOC Data Exchange Policy, adopted by the Assembly in 2003, should serve as the "guiding principle" for IOTWS. (Note: Though the U.S. endorsed the IOC Data Exchange Policy, the Policy refers only to oceanographic data, not to seismic or other types of data crucial to an effective tsunami warning system.) The Communique ultimately recommended that all Member States "make every endeavor" to share seismic, sea-level and other data relevant to tsunamigenic events at or near real-time.

¶9. The Pacific Tsunami Warning Center and the Japan Meteorological Agency agreed to provide interim tsunami alerts to the Indian Ocean region based on existing facilities until adequate warning capabilities are established within the region. Four nations in the region (Australia, India, Indonesia, and Thailand) confirmed their plans to establish systems and capacities to detect and measure tsunamigenic events and issue appropriate warnings to forecast their impacts. Until and unless a regional center is identified, the national centers agreed to supply product and services to other national centers in the region.

¶10. Discussions were organized by topic, addressed first in panel and later in three separate working groups. The three main topics were technical aspects, organizational aspects, awareness and preparedness.

Technical Aspects
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¶11. The panel on the technical aspects of tsunami warning systems (TWS) was chaired by the representative from Indonesia who presented some graphical material on the effects of the recent tsunami and the need for improvement of monitoring and warning technologies in the Indian Ocean. The panel was made up of scientific and technical presentations by experts from the Russian Federation and Japan. The Russian expert presented statistics on tsunami occurrence and likelihoods of tsunami generation and their severity from earthquakes of various magnitudes. The Japanese experts covered the current technologies used in Japan to detect tsunami and issues warnings, with particular emphasis on the challenges of warnings of local tsunamis compared to those caused by distant earthquakes. Presentations also reviewed the factors controlling tsunami height and on-shore run-up. The Chair of the IGC/ITSU gave the most scientifically controversial presentation by describing "emerging technologies" for tsunami detection and warning, including perturbation measurement from the ionosphere, infrasound measurements, satellite-based ocean height measuring systems, and on-shore radar.

¶12. Dr. Neville Smith (Australia) chaired the technical aspects a working group, which was tasked to identify and recommend: (1) the technological basis for a tsunami warning system (measurements and telecommunications, analysis, processing and hazard/risk assessment); (2) design elements of an IOTWS, (3) the strategy for building an IOTWS, and (4) new technologies and research and development needed. The resulting report consists of provided both general and specific a series of bulleted points recommendations that will be considered in for the preparation of the design plan:

- free and immediate flow of raw observational data, in real time over robust communication links, to all national and regional participants in the system is a necessary component for TWS.
- common approaches to data processing, hazard and risk modeling, and warning dissemination and message format are essential.
- coastal bathymetry, sea floor configuration, topography and land mapping are essential and must be carried out and be made available in high resolution format for all at-risk

national coastal regions.
 - utilization of new technologies should be explored.
 - the requirements for use of space technology for tsunami applications must be defined.

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 - network must enable the rapid verification of tsunami waves from sea-level and ocean-bottom sensors.
.- geostationary communication satellites operating in the Indian Ocean region and the use of Global Telecommunication System (GTS) of WMO, currently operational used for the Pacific Tsunami Warning System (PTWS) for collection of sea-level observations and distribution of bulletins and warnings, should be upgraded within 6 months and fully operational to address needs of the Indian Ocean region in the interim and longer-term be explored.
 - broadband is needed for real-time distribution of seismic data.
 - telecommunication systems that meet these requirements should be identified and utilized.
 - risk management framework should be employed and complemented by robust models and scenarios of historical and potential tsunami events that can be used in the formation and dissemination of warnings.
 - for both seismic and sea level networks - upgrades must must be identified and prioritized.
 - establishment of deep ocean buoys useful for tsunami monitoring is needed.
 - cable-based systems should also be assessed as these instruments are important for slumping events and other events that are not seen in seismic measurements.
 - network planning should start with identifying and mapping the tsunami prone areas.  This should be based upon a historical study of earthquake and tsunami occurrences.
 - robustness and durability of the instruments and the system as a whole to the impacts of the earthquakes needs to be considered
 - emerging technologies should be considered in the overall strategy, to ensure the evolution of the system relative to best practice.

¶13.  During the instrumentation and communication discussions, vocal participants with narrow interests often held the floor and carried their positions forward. Nevertheless, there was the recognition that many of the pieces for the ITOTWS are in place or in progress; the challenge rests in putting the pieces together in a structure that has the needed telecommunication, data processing, and warning dissemination capacities.

¶14.  The general strategy of the IOTWS was defined to include: immediate, free and open distribution of raw data from the observing systems in real-time must be acknowledged as a founding principle for all regional and global tsunami warning systems, since without, both the timeliness and effectiveness of the system may be severely compromised.  It was noted that many of the standards that underlie the systems for open data collection and exchange can be adopted ( or adapted) from already established international systems.  A sustained and reliable network will require sustained investment, national commitments, and international cooperation.

¶15. In terms of the technological implementation, it was agreed that the tsunami warning system as a whole should be build on and be a part of a multi-purpose system, since . the sustainability of the observing system including cost effectiveness and efficiency are also enhanced with such an approach.

¶16.  As the tsunami early warning system will be based upon various data acquisition and dissemination platforms, it was emphasized that the

 -network of stations for tsunami early warning should be constantly monitored to guarantee its reliability and effectiveness.
 - data must be quality controlled, and archived for post-event assessment and research.
 - observation systems should be qualified and certified.
 - warning criteria and standards need to be established drawing from PTWC protocols.

The legal responsibility for issuing warnings (that may lead to evacuation) are assumed by national centers (unless other arrangements are agreed upon by countries).

Organizational Aspects
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¶17.  The panel on "Organizational and Practical Arrangements for a Regional Tsunami Warning and Mitigation System" featured presentations by the national programs of Chile and Japan.  Dr. Charles McCreery, Director Pacific Tsunami Warning Center, and Dr. Laura Kong, Director, International Tsunami Information Center (ITIC) presented regional

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dimensions.

¶18. It was noted that National centers are responsible for interpreting warning guidance from regional center(s), issuing local warnings, and issuing alerts for local events, while regional centers provide efficiency of operations, access to a larger suite of observations, and sharing of services. Regional centers also provide serve as a focal point for mitigation activities, communications between stakeholders, products (e.g., tsunami travel and height maps), services (e.g., testing of communications systems, expertise exchange, quality control), and can provide backup functions for national centers. Regional commitment and support and support from , national support, and international support levels can guarantee long-term sustainability of regional centers.

¶19. Kong described how the ITIC monitors the international tsunami warning system for the Pacific to improve

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operations, assists member states with technology transfer, and provides technical assistance and training to improve national and community-level preparedness. Kong also noted the importance of hazard reduction strategies, including preparation of inundation maps, evacuation maps, simulations and drills, to facilitate an effective response to tsunami warning. ITIC training programs and outreach materials were offered to help prepare both national emergency management agencies and local communities to respond appropriately to tsunami warnings.

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¶20. Conclusions of the working group on the organizational aspects of an IOTWS were captured in the Communique.

AWARENESS AND PREPAREDNESS
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¶21. The panel addressed on Tsunami awareness and preparedness reviewed national preparedness plans (New Zealand and Indonesia), community-based early warning systems (ISDR, Red Cross), awareness building and public information (Asian Disaster Reduction Centre), and institutional capacities for moving forward (UNDP).

¶22. The corresponding working group reviewed (1) risk and vulnerability assessment; (2) public awareness and education; and (3) preparedness and emergency response. To address risk reduction, the group called for preparation of hazard risk, inundation and evacuation maps that identify escape routes, safe areas and shelters. The group acknowledged other methods of reducing risks - beyond the scope of ITSU - including land-use planning, structural interventions (building codes, coastal structures, elevated shelters), and non-structural interventions (protection, rehabilitation, and conservation of coastal ecosystems, including mangroves and coral reefs that help buffer coastal communities).

¶23. Awareness, education, and public outreach as were noted as essential ingredients in tsunami early warning systems, recognizing that innovation and local knowledge to can be used to build a culture of safety. The group also called for special attention to building national and local preparedness and emergency response capacities, with clear and careful delineation of functions and responsibilities.

BEYOND THE INDIAN OCEAN
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¶24. The final session on "The Indian Ocean System within a Global Framework" provoked substantial debate as to how other region's tsunami warning systems (e.g., Mediterranean and Northeast Atlantic, Caribbean and Central West Atlantic, and Southwest Pacific) would be reflected in the Communique. India and other IO members provided text that limited examples to areas adjacent to the Indian Ocean, such as South-East Asia and the South China Sea.

Participating Organizations
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¶25. Several organizations were invited to make announcements during the proceedings:

Asian Disaster Preparedness Center (ADCP) - Described experience in regional disaster projects and described a regional TWS that includes earthquake and tsunami monitoring.

Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) - Offered to share data archival technology.

Global Earth Observational System of Systems (GEOSS) -Guy Duchossois described program and presented Tsunami Communique.

GLOSS (IOC global sea level program) - Described current contribution in IO and recommended expansion of real time reporting stations.
International Maritime Organization (IMO) - Described how warnings might be disseminated via ships.

Incorporated Research Institutions for Seismology - David Simpson described the standardized, real-time global seismic network, how it detected the Dec 26 earthquake, and how it could contribute to a global TWS.

International Telecommunications Union (ITU) - Described their role in communications for all aspects of TWS.

UN/ESCAP- - Described capabilities as they relate to a regional of global TWS.

WMO - Described operational role in world weather forecasting and recommended that the TWS use their Global Telecommunications Networks to deliver tsunami warning information to ION nations.

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